

REMARKS

Claims 1-9 and 24-27 remain pending in the captioned case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Section 112, 1st Paragraph, Rejections

Claims 1-9 and 24-27 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing the enablement requirement. The § 112 rejection is traversed for at least the reasons set forth below.

Present claim 1 recites:

A method for forming an apparatus configured to reduce electromagnetic interference between a pair of antennas coupled to a wireless communication device, wherein the method comprises: extracting a shape of the apparatus from a thin sheet of conductive material; and folding the shape into a plurality of resonant circuit elements, each configured to resonate at or near a carrier frequency of a signal transmitted by one of the pair of antennas; and wherein by the steps of extracting and folding, the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength.

In the current Office Action, the Examiner suggests that the exact transmitted signal frequency/wavelength and the exact length of the apparatus are critical or essential to the practice of the invention (see, Office Action, page 2). Because these features are not included in the claims, the Examiner concludes, under *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976), that the claims fail to meet the enablement requirement. The Applicants respectfully disagree.

The Applicants acknowledge that, whenever a feature is taught as critical in a specification and is not recited in the claims, the claim should be rejected under the enablement provision section of 35 U.S.C. 112. *In re Mayhew*, 527 F.2d 1229, 1233, 188 USPQ 356, 358 (CCPA 1976); MPEP 2164.08(c). However, the features pointed out by the Examiner -- i.e., the exact wavelength and the exact apparatus length -- are not critical or essential to the practice of the invention.

For the invention to function as intended, the apparatus must include “a plurality of resonant circuit elements, each configured to resonate at or near a carrier frequency of a signal transmitted by one of the pair of antennas.” As noted in the specification, the claimed “plurality of resonant circuit elements” forms a periodic surface, which resonates to intercept at least a portion of the energy radiated from a first antenna and redirect the intercepted portion away from a second, co-located antenna (Specification -- page 8, lines 1-21). In a general embodiment, the periodic surface of the apparatus may be “configured to resonate by setting various dimensions of the apparatus to some fraction of a wavelength of the transmitted signal” (Specification -- page 8, lines 23-25).

In one preferred embodiment of the invention, the specification teaches:

... the total length [of the apparatus] is preferably equal to approximately one-half of the longest [transmission signal] wavelength. In doing so, about half of the radiated energy will be scattered in one direction, while the other half is scattered in a substantially opposite direction. This provides maximum interference reduction by canceling most, if not all, of the radiated components from the incoming electromagnetic wave (Specification -- page 33, lines 21-26).

Although an apparatus length of about 62mm is suggested for a 2.4Ghz signal (Specification -- page 33, lines 10-26; page 35, line 28 – page 36, line 21), the specification clearly states that the length of the apparatus is not limited to a particular transmission signal frequency/wavelength (Specification -- page 17, lines 16-28; page 36, lines 23-29).

In determining whether an unclaimed feature is critical, the entire disclosure must be considered. Features which are merely preferred are not to be considered critical. *In re Goffe*, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976). Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality. MPEP 2164.08(c).

As noted above, the claimed apparatus may be optimized by setting the length equal to approximately one-half of the signal transmission wavelength in a preferred embodiment of the invention. However, such optimization is not critical or essential to the practice of the invention, nor is it critical or essential that the exact apparatus length or wavelength be claimed. Therefore, Applicants assert that the rejection of the current claims under 35 U.S.C. § 112, first paragraph, is improper and should be removed in its entirety.

Section 112, 2nd Paragraph, Rejections

Claims 1-9 and 24-27 were further rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claims 1-9 and 24-27 were rejected for not claiming the exact length of the apparatus or the exact transmitted signal wavelength. (See, Office Action, page 3). The current § 112 rejection is traversed for at least the reasons set forth below.

The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. § 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. When the examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

MPEP 2173.02.

As noted above, present claim 1 recites various limitations on a method for forming an apparatus, which is configured to reduce electromagnetic interference between a pair of antennas coupled to a wireless communication device. Contrary to the Examiner's suggestions, the subject matter recited in claim 1 is defined with a reasonable degree of clarity and particularity, especially when analyzed in light of the above-mentioned requirements for definitiveness.

For example, the present claim states that "wherein by the steps of extracting and folding, the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength." The contents of the specification provide one possible apparatus length (e.g., about 62mm) for an example transmitted signal wavelength (e.g., a 2.4Ghz signal) (Specification -- page 33, lines 10-26; page 35, line 28 – page 36, line 21). However, the specification clearly states that the length of the apparatus is not limited to a particular transmitted signal wavelength (Specification -- page 17, lines 16-28; page 36, lines 23-29). When analyzed in light of the specification, one skilled in the art would interpret the apparatus length as being dependent on transmitted signal wavelength, but not restricted to a particular wavelength.

The presently claimed apparatus length is definite because it is defined in the claims with a reasonable degree of particularity and clarity. As such, removal of the § 112, second paragraph, rejection of claims 1-9 and 25-28 is respectfully requested.

Section 102 Rejections

Claims 1-9, 24 and 26-27 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,411,261 to Lilly (hereinafter "Lilly"). The standard for "anticipation" is one of fairly strict identity. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art of reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP 2131. Furthermore,

anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, as arranged in the claim. *W.L. Gore & Assocs. V. Garlock*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983). Using these standards, Applicants submit the cited art fails to disclose each and every element of the currently pending claims, some distinctive features of which are set forth in more detail below.

Lily fails to anticipate a method for forming an apparatus in which a length of the apparatus is substantially equal to one-half of a signal transmission wavelength. Present claim 1 recites in part:

A method for forming an apparatus configured to reduce electromagnetic interference between a pair of antennas coupled to a wireless communication device, wherein the method comprises: extracting a shape of the apparatus ... folding the shape into a plurality of resonant circuit elements, each configured to resonate at or near a carrier frequency of a signal transmitted by one of the pair of antennas; and wherein by the steps of extracting and folding, the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength.

The present invention provides a method for forming an apparatus, which is configured to reduce the amount of electromagnetic interference between two or more antennas coupled to a wireless communication device (Specification -- Fig. 6 and supporting text). In the presently claimed embodiment, the apparatus is formed by extracting a shape of the apparatus from a thin sheet of conductive material, and folding the shape into a plurality of resonant circuit elements. Although the resonant circuit elements may be formed somewhat differently in various embodiments of the invention (Specification -- Figs. 7, 10, and 11 and supporting text), each of the resonant circuit elements is configured to resonate at (or near) a carrier frequency of a signal transmitted by one of the antennas. In order to provide maximum interference reduction, the presently claimed method forms the apparatus, such that a length of the apparatus is substantially equal to one-half of the transmitted signal wavelength. “In doing so, about half of the radiated energy will be scattered in one direction, while the other half is scattered in a substantially opposite direction. This provides maximum interference reduction by canceling most, if not all, of the radiated components from the incoming electromagnetic wave” (Specification -- page 33, lines 19-26).

Lilly discloses a method for manufacturing an artificial magnetic conductor (AMC). For example, Lilly forms an artificial magnetic conductor (i.e., the alleged “apparatus”) by forming posts 106 and slots 108 within a post plane 104 (Lilly -- Figs. 1-2). The posts are then operatively disposed adjacent to a frequency selective surface (FSS 102) including “one or more conductive shapes 110 printed or plated onto a substrate 112” (Lilly -- col. 3, line 47 – col. 4, line 2).

In column 4, Lilly provides dimensions for the height (h) of the posts 106 and the period between the posts shown in Figs. 1 and 2. For example, Lilly suggests that “the height of the tabs above the post plane is in the range of about 0.005λ through about 0.05λ , where λ is the wavelength” (Lilly -- col. 4, lines 45-47). In addition, Lilly suggests that the “period and lattice arrangement of the posts 106 may match the periodic features of the FSS 102 … [i]n one aspect, the period may be as small as about 0.02λ for a square lattice” (Lilly -- col. 4, lines 47-53).

However, Lily is completely silent about the length of the subsequently formed AMC. In addition, Lily fails to provide teaching, suggestion or motivation for maximizing interference reduction between a pair of antennas. More specifically, Lily fails to mention the possibility or desirability for maximizing interference reduction by providing an apparatus, which is capable of scattering approximately half of the radiated energy in one direction, while the other half is scattered in a substantially opposite direction. Therefore, Lily cannot be relied upon to anticipate an apparatus, whose length is uniquely configured for scattering radiated energy in such a manner. In other words, Lily fails to anticipate a method for forming an apparatus in which a length of the apparatus is substantially equal to one-half of a signal transmission wavelength, as recited in present claim 1.

On pages 3-4 of the Office Action, the Examiner suggests that Lilly provides teaching for the claimed apparatus length by disclosing that the height of the apparatus is about 0.005λ to about 0.05λ (in column 4, lines 45-47) and showing that the length (x) of the apparatus is about 14 times the height (y) of the apparatus (in an attachment provided along with the Office Action of a marked-up Fig. 10). The Examiner obtains the 14x kicker by physically measuring the length ($x \approx 70\text{mm}$) and height ($y \approx 5\text{mm}$) of the apparatus shown in the attachment. The Examiner uses these measurements to obtain an alleged length of about 0.07λ to 0.7λ for Lilly’s apparatus, and to argue that such length

could be used to anticipate the presently claimed length of about 0.5λ . The Examiner's logic is flawed and improper.

The Applicants concede that drawings and pictures can anticipate claims if they clearly show the structure which is claimed. *In re Mraz*, 455 F.2d 1069, 173 USPQ 25 (CCPA 1972); MPEP 2125. However, when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. *See Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000). Furthermore, "it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue." MPEP 2125.

As noted above, Lilly is completely silent about the length of the subsequently formed AMC (i.e., the alleged "apparatus"). In addition, Lilly specifically states that the "components in the figures are not necessarily to scale" (Lilly -- col. 2, lines 54-55). Therefore, arguments based on measurement of the drawing features are of little value in an anticipatory rejection. Accordingly, Applicants respectfully request that the § 102 rejection of claims 1-9, 24 and 26-27 be removed.

Section 103 Rejections

Claims 1-9 and 24-27 were further rejected under 35 U.S.C. §103(a) as being unpatentable over Lilly. To establish a case of *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A 1974), MPEP 2143.03. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), MPEP 2143.01. Using these standards, Applicants contend that the cited art fails to teach or suggest all features of the currently pending claims, some distinctive features of which are set forth in more detail below.

Lily fails to provide teaching, suggestion or motivation for a method of forming an apparatus in which a length of the apparatus is substantially equal to one-half of a signal transmission wavelength. As noted above, Lilly fails to provide teaching or suggestion for the length of the disclosed AMC structure (i.e., the alleged “apparatus”). In addition, Lily lacks the necessary motivation that would enable one skilled in the art to modify the teachings of Lilly to produce an apparatus, whose length is substantially equal to one-half of a signal transmission wavelength. As such, Lilly cannot be relied upon to provide teaching, suggestion or motivation for all limitations recited in present claim 1.

On page 6 of the Office Action, the Examiner states “[r]egarding claim 1, if [Applicants] argue that Lilly does not teach the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength then it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the apparatus [as claimed] … [since] it has been held that where the general condition of a claim [is] disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233” (Office Action, page 6). In particular, the Examiner argues that Lilly discloses the “general condition of the claim” by disclosing a range of “about 0.07λ to 0.7λ which includes the claimed one-half of the signal transmission wavelength of the present application” (Office Action, page 7). The Applicants respectfully disagree.

Contrary to the Examiner’s suggestions, Lilly does not disclose the “general condition of the claim.” The Examiner argues that Lilly discloses a range of “about 0.07λ to 0.7λ .” As noted above, the Examiner’s arguments are based on physical measurements of the drawing features shown in the attachment of Fig. 10, which the Examiner provides along with the Office Action in support of the alleged teaching. However, arguments based on measurement of the drawing features are of little value when the reference does not disclose that the drawings are to scale and is silent as to dimensions. MPEP 2125. As noted above, Lilly is silent about the length of the apparatus and specifically states that the “components in the figures are not necessarily to scale” (Lilly -- col. 2, lines 54-55). Therefore, the alleged range of “about 0.07λ to 0.7λ ” cannot be used to disclose the “general condition of the claim.” Since the “general condition of the claim” is NOT disclosed in the prior art, discovering the optimum or workable range would involve

more than routine skill in the art. The Examiner's support of teaching within Lilly is, therefore, disproved.

For at least the reasons set forth above, Lilly fails to provide teaching or suggestion for all limitations recited in present claim 1. In addition, the teachings of Lilly cannot be modified to read upon all limitations of present claim 1. As a result, present claim 1 and all claims dependent therefrom are patentably distinct over the teachings of Lilly. Accordingly, Applicant respectfully request that the § 103 rejection of claims 1-9 and 24-27 be removed.

CONCLUSION

The response is believed to be a complete response to the issues raised in the Office Action dated January 18, 2007. If the Examiner has any questions, comments or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Daffer McDaniel, LLP Deposit Account No. 50-3268.

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